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REVIEWING RARE SYNDROMES

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Abstract
This article is an examination of the Rare Syndromes The scientific development and subsequent "syndromes" continues to influence the researchers all over the globe today. This article examines the research done and published by researchers and scientists. Consideration of current trends and data in scientific queries and demonstrates further aspects of auto brewery syndrome, alien hand syndrome, Alice in wonderland syndrome. Additionally, this article explores options for syndrome listed with some significance.
Keywords: Rare Syndromes, Autobrewery Syndrome, Alien Hand Syndrome, Alice In Wonderland Syndrome.

1. Introduction:

The following paper on reviewing rare syndromes examines conditions that are highly uncommon, which include, auto brewery syndrome, alien hand syndrome and Alice in wonderland syndrome. Each review is derived from meta-analysis and research from scientists. This paper sets out to understand the aspects of these rare syndromes.

The 3 syndromes, namely: Alice in wonderland syndrome – which is a manifested neurological disorder, Auto brewery syndrome – which is caused due to the imbalance of certain bacteria in the GI, and Alien hand syndrome – which is a disorder associated with sensory nerves, are all explored from a biological perspective, using statistics from different studies to support arguments and provide evidence. These syndromes are extremely rare, with fewer that 100 cases per year, which warrants research regarding the nature and treatment of these diseases, hence, leading us to study these topics in detail to write this paper.

Contrary to common methods to answer research questions, which usually include first-hand data collection, we used statistics from multiple sources, and studies to arrive to our conclusions in this paper. We used research journals, and other databases to review papers and write about the aforementioned syndromes.

Lastly, all these syndromes are highly uncommon, and therefore they are often misunderstood. This misunderstanding either leads to the syndrome being undertreated, or not treated correctly. The objective of this paper would be to gather as much information as possible, to improve treatment procedures of these cases, as well as make them recognizable by clearing any misunderstanding.

2. Methods:

The study was conducted using four databases Google Scholars SAGE, DOAJ and PubMed. Selection of papers were done based on keywords and theme relevant to this review. Further the published papers from these databases were arranged in systematic order with respect to year of publication.

3. Results and discussion:

1. Alice in wonderland syndrome

lice in Wonderland syndrome: A rare neurological manifestation with microscopy in a 6-year-old child

AIWS reports a group of traits with changes of body framework. AIWS comprises of perceptual disturbances. Predominant visual distortions happen at night. The underlying etymology related to AIWS is not yet clearly understood. Some general reasons of AIWS are chronic conditions like migraine and epilepsy, brain tumours, psychotic drugs of EPV infections and other infections. There is no establishment of proper diagnostic setup and treatment plan for AIWS. Some inhibitory medications for migraine episodes and migraine diet constitute a general part of therapy for AIWS patients.

An incident of a boy who is 6-years old complaining of perceptual distortions like objects becoming smaller and going farther due to microscopy is reported. Particularly these auras happened during dusk for 15 to 20 minutes. Brain MRI was done, and the reports did not show any abnormal incidence. Serological examination for Epstein-Barr virus was also done and reports of that came out to be completely normal. There was no presence for H1N1 and antibodies against borrelia burgdorferi. EEG report was also normal. Medications and therapy were started to treat the symptoms.

The most common trait of AIWS is changes in body framework experienced by oneself, where an individual falsely perceives the part of his own body out of proportion.

Other typical trait is the patient visualizing incorrect sizes of different items. Migraine is a very dominantly marked trait of AIWS. In AIWS , patients experience time distortions where time either moves too fast or too slow, queer hallucinations and bizarre illusions. Hearing and touch sensations of an individual get twisted along with the visual sensations. AIWS is an unique and a rare syndrome and thus little is known about this conditions because very few cases of AIWS are reported. Epilepsy of the temporal lobe is a reason behind the occurrence of AIWS. Brain tumours also stimulate temporary AIWS. In general the symptoms of AIWS which suddenly occur for a short period of time are not life threatening and can be treated to some extent. But chronic cases of AIWS cannot be treated. While experiencing hallucinations associated to AIWS, a patient remains well aware of the fact that those are not happening in real life but still they get panic attacks and anxious. Vastly migraine being a prominent symptom of AIWS, migraine inhibitory medications and migraine diet are usually prescribed to patients for relief.

The Alice in Wonderland Syndrome: A Case of Aura Accompanying Cluster Headache

A chief form of headache is cluster headache (CH) that has very particular and delicate basis in absence of a feeling. Here for the very first time in clinical study an incident of a 35-year-old man is reported who have AIWS as CH complexion. In CH cases with AIWS complexion, valproate is favoured for therapy.

The character of migraine is marked by focal visual/sensory/speech distortions prior to or after an episode of headache prevalent for 5 to 20 minutes . Complexions are not always migraine based, they can happen in connection to Hemicrania continua and also with paroxysmal hemicrania. Here for the very first time in clinical study an incident of a 35 year old man is reported who have AIWS as CH complexion. The term AIWS was first coined by famous British psychiatrist John Todd, although AIWS was primarily described by famous American neurologist Lippmann. The name of this unique and rare syndrome is taken from Caroll's famous novel Alice's Adventures in Wonderland where Alice experienced bizarre illusions and queer hallucinations.

Here for the very first time in clinical study an incident of a 35 year old man is reported who have AIWS as CH complexion who had past medical record of CH events for 4 years that happened 3 to 5 times a day and lasted for less than one hour. Initially the patient did not experience any pain but later after an year he complained of major and pulsating headache on the left orbital and peri orbital region with simultaneous ipsilateral conjunctival hyperaemia and nasal congestion. As inhibitory measures of these issues, the patient was given subcutaneous sumatriptan and methylprednisolone. The headache was associated with multiple experiences of perceptual disturbances like objects moving closer or farther or becoming smaller and larger, growing of left side of the head and also alterations in own body colour. All these led to a sense of fear and anxiety in the patient and he was sent for psychiatric consultation with AIWS reports suggested to be psychiatric. Neurological evaluation, blood tests, brain MRI and other physical and physiological reports were normal with the patient having no ancestral record of migraine. Methylprednisolone was given to the patient due to which headache was gone but issue of perceptual disturbances was not resolved. So valproate was given in addition according to required dosage that led to complete relief from headache and perceptual aura

A chief form of headache is cluster headache(CH) that has very particular and delicate basis in absence of a feeling. CH is clinically marked by major unilaterally temporal or peri-orbital pain for 15 minutes to 2 hours, assisted by traits in the nose, eyes and face. CH happens with an aura in circadian periodicity as clustered attacks in bouts.VPT treatment happened to be effective for the therapy in CH patient with AIWS complexion in this case.

Alice in Wonderland Syndrome: A Clinical and Pathophysiological Review

AIWS is a rare syndrome of perceptual disturbances, primarily described by Todd. Aschematia and dysmetropsia include comprise of prominent traits of AIWS. AIWS has numerous diagnosis, but in children Epstein- Barr virus infection and in adults migraine happen to be the general source. AIWS is somewhat related to migraine in certain cases. Temporoparietal-occipital carrefour (TPO-C) is a major area for growing of various AIWS traits. Modulation of TPO-C largely controls the traits of AIWS where perceptive and somaesthetic data are assorted and due to which simultaneous incidence of dysmetropsia and aschematia may happen

AIWS being a rare syndrome influence the combined process for the growth of various relations. Disassociation and unrelatedness between oneself and the surrounding in AIWS cases lead to visual disorientations. Here the real experience of bizarre perceptions by Lewis Caroll is narrated. Based on neuroimaging data, some medical features of AIWS are also inferred.

Method: With the help of PubMed database and by using required query like AIWS, Alice in Wonderland syndrome, macropsia,macropsia,macrosomatognosia,microsomatognosia and others a literature survey was done and 94 articles were finally selected for thorough study.

The Art-Disease Relationship: It is well-established fact that often any form of artworks by artists are inspired from their own real life experiences which also includes their illness. Lewis Caroll's Alice's Adventures in Wonderland, Through the Looking-Glass and What Alice Found There, was majorly a reflection of his own experiences in his real life. The diaries and notes of Caroll has largely proven the fact that he suffered from migraine and he seldom complained of nauseous headache and major vomiting, Caroll experienced many queer visual disturbances and

time distortions for which he consulted ophthalmologists as well.

AIWS as a clinical syndrome: Lippman and thereafter Coleman first reported patients experiencing perceptual disorders. Later to that Todd coined the term AIWS. Patient experienced migraine, macrosomatognosia, microsomatognosia, dysmetropsia.macropsia,micropsia,telopsia,pelopsia,disassociation, time distortions, hallucinations, illusions, zoopsia,hypercusiakinetopsia,hypoacusia and dyschromatopsia. Ver few cases of AIWS are reported of and thus there is a lack of understanding of proper prognosis for AIWS. For a little clear diagnosis setup, visual disturbances are considered as primary trait of AIWS, followed by simultaneous occurrence of somatosensory and perceptual disorder and somatopsychic disorder. AIWS has its own causes like headaches, epilepsy, infectious diseases, cerebrovascular diseases, psychiatric disorders, substance abuse and underlying aetiologies like migraine, tension type headache, depression, anxiety, EBV injection, frontal lobe epilepsy, schizophrenia, LSD, dextromethorphan. Temporoparietal-occipital carrefour (TPO-C) is a major area for growing of various AIWS traits. Modulation of TPO-C largely controls the traits of AIWS where perceptive and somaesthetic data are assorted and due to which simultaneous incidence of dysmetropsia and aschematia may happen. AIWS is strongly related with chronic conditions like migraine and epilepsy in many cases.

Conclusion and Future Perspectives: Due to much less cases being reported, AIWS is not clearly understood and thus proper diagnosis setup for it is yet to be established. In cases of migraine being the cause for AIWS, migraine prophylactic therapy is a very relevant suggestion for resolving both AIWS and migraine. Brain changes responsible for AIWS are mainly located in TPO-C,with major areas of AIWS being POJ and angular gyrus. Finer anatomical and functional reviews of AIWS pathophysiological procedures are very much needed with a main prerequisite being the establishment of a well-defined and universally accepted diagnostic setup.

Alice in Wonderland syndrome: a strange visual perceptual disturbance

John Todd, a renowned British psychiatrist primarily coined the term Alice in Wonderland (AIWS) in 1955 to narrate few queer somatosensory moods requiring the framework of body and other items. The term is given after Lewis Carroll's famous novel Alice's Adventures in Wonderland where Alice happened to undergo various changes in her body pattern during the occurrence of the story. Alice also experiences microsomatognosia or macrosomatognosia. These perceptual disturbances may happen in epileptic seizures, encephalitis,drug intoxication ,patients with brain lesions or schizophrenia. Chronic conditions like migraine and epilepsy are the reasons behind this kind of perceptible traits. Here a unique case of a young AIWS patient is reported who happens to undergo an intermittent visual contortion by seeing her cat as a large tiger.

AIWS is an unusual state marked by the repetitive perceptual disturbances like micropsia, macropsia,teleopsia or pelopsia in movement and framework of items. It is usually linked with chronic condition like migraine or use of specific psychoactive drugs or intracranial tumours. It may also be the early trait of the Epstein-Barr virus infection. The traits of AIWS are seldom distinguished and very distracting mainly through the occurrences of modified body framework. The patients may be jumbled with their own body pattern. Few people encounter bizarre illusions like witnessing items that others do not usually witness. Rare traits are the loss of motor control, damaged memory, general disturbances, persisting auditory and visual perceptions and emotional incidents. This paper deals with a rare case of AIWS where an upset young girl intermittently visualizes her cat as a large tiger that leads to depression.

Case Description: A female of 18 years age was taken to the psychiatry department of a clinic by her guardians. Her past record reported an issue of perceiving her cat and few other items larger and in various colours than they actually are for a month. Her history also reported of seeing her father's head in blue colour and larger than usual. Her main trouble is her perception of her cat as a large tiger. The patient also encounters few specific visual disturbances like letters growing larger while she is studying or her mother becoming bigger than usual or her mother moving apart and away from her while standing just next to her. All these issues established a sense of anxiety in her. These issues occurred periodically and lasted for a short span of time. She has encountered juvenile migraine with aura from 7 to 14 years of age. There was no damage in consciousness, posture,automatisms,no neuropsychiatric history, no infections,head trauma. Maternal past record of a migraine was reported. The girl being a university student, was not on any drugs. Physical, biochemical and neurological tests disclosed no pathology. EEG and MRI reports of the brain were usual. Psychiatric evaluation revealed of her consciousness and good orientation to time,place,person and situation. She was upset and anxious because of these present issues. Her mind was concentrated on the fact of her experiencing perceptual disturbances. Intelligence,memory,reality testing and judgement ability were accurate. Alprazolam which is an anxiolytic agent was given and then stopped after 10 days as the patient was responding efficiently to treatment. In order to subside the traits of depression and AIWS, escitalopram was given for 6 months. Psychoeducation was also given to the patient by stressing on coping strategies like escaping from the territory where the visual disturbance was perceived. She was also ascertained that these visual distortions were not happening in reality and would vanish shortly.

Todd's syndrome is a rare condition marked by metamorphopsias of items, body patterns and occurrence of

time. It is a short term occasional visual distortion, happening abruptly with an asymmetrical pattern. The general traits include micropsia,macropsia,pelopsia and teleopsia. Patients with no amnesia encounter disturbances in perception of time. Commonness of AIWS is more about 15% of the migraine sufferers. Features of AIWS are narrated hardly amongst the common mass. It may establish as a comorbid condition. AIWS is crucially linked with chronic conditions like epilepsy and migraine. AIWS can happen after hallucinogen intoxication,hyperpyrexia,hypnagogic conditions and schizophrenia. Lyme neuroborreliosis, Epstein-Barr virus and other diseases are behind the underlying etymology. Depression,anxiety,bipolar disorder and obsessive-compulsive disorder are linked with AIWS. Based on medical history, physical evaluations and tests and certain distinct traits of AIWS, the diagnosis and prognosis of AIWS is done. Although the distinctive diagnosis of AIWS and its multiple traits are quite compound as it has minimum of three degress of expression. Assuring the patient is crucial in case of AIWS. Pharmacologic treatments include antiepileptics,migraine prophylaxis, antiviral agents or antibiotics, antipsychotics, antidepressive and anxiolytic agents as per requirement. Electroconvulsive treatment and repetitive transcranial magnetic stimulation(rTMS) treatment were very useful in some cases of AIWS. AIWS is a crucial syndrome with multiple clinical and psychiatric complications with its pathophysiology and etiological process remaining ambiguous.

Alice in Wonderland Syndrome as a Presenting Manifestation of Creutzfeldt-Jakob Disease

Alice in Wonderland syndrome (AIWS) is an infrequent neural disorganization marked by perceptual disturbances (metamorphopsias), contortions in body framework and incidence of time as well as disassociation. 85% patients report with visual disturbances in a sole sensual manner like exclusively optical or somatosensory in nature. Additionally, the mass encounter solely an individual kind of contortion like exclusively micropsia or macropsia. AIWS includes numerous dissimilar diagnosis and thus a vast distinctive prognosis. Its compliance to medication and therapy rests on the primary chronic procedure, which is mainly encephalitis in children and migraine in adults. In the published works, less than 180 medical incidents of AIWS have been narrated, among which 50% exhibited a approving diagnosis. But, non-medical incidents have been narrated in 30% of common mass. This infers that AIWS may not be that rare as commonly perceived and diagnostically AIWS is normally of no harm. AIWS can be a avatar of serious and mortal states like brain tumour or brain infarction. Here a case of AIWS generated by sporadic Creutzfeldt-Jakob disease(CJD) is reported.

The patient was under treatment., but as his death happened in 2 months after his symptoms of AIWS started, a written clearance was secured from his family to produce.

Case Description: In this case, beginning of sickness was immediate and quickly developing, initiating with discrete optical traits. Traits of AIWS include akinetopsia, chloropsia, micropsia, macropsia, zoom vision and time contortions like rapid movement occurrence and extended time span. Shortly these were convoluted by paraesthesias, gait instability, aphasia, expressive amusia, cognitive decline and social alterations in the manner of anxiety and insanity. The prognosis of expected sporadic CJD was established with the help of a brain MRI and CSF. Due to lack of any treatment choices, the patient was discharged from the hospital and in 2 months he died after his perceptual traits had started. Clearance for autopsy was not procured.

The patient reported with a huge amount of metamorphopsias with CJD being the ultimate source. Prognosis of suvch specific CJD can be setup by post mortem by autopsy but clearance for autopsy was not obtained.Yet MRI reports were positive in 83% of the events of probable CJD.

Alice in Wonderland Syndrome: AIWS is a rare syndrome marked by visual disturbances, time contortions, dissociation, body alterations. John Todd narrated AIWS for the very first time in 1955. Alice encountered AIWS at the time of her visit to Wonderland, as narrated by Lewis Caroll in his famous novel Alice's Adventures in Wonderland. The real name of Caroll was Charles Lutwidge Dodgson. Lipmann along with Todd and many others proposed that Dodgson himself went through AIWS in the pretext of migraine, epilepsy or maybe substance abuse which acted as a source of inspiration for him to instil this kind of abnormal nature in the main lead of his famous novel. Perceptual disturbances in AIWS include bizarre hallucinations and illusions, macropsia, micropsia,teleopsia and dysmorphopsia. The traits of AIWS occur periodically and are short-lived. 8 familiar categories of primary diagnosis are there that include infectious diseases, central nervous system lesion, peripheral nervous system lesions,psychiatric disorders, medications, substance abuse and a mixed group. Medical events of AIWS thus require neurological, auxiliary and psychiatric consulations.

Creutzfeldt-Jakob Disease: CJD is a very fatal and rare disease. CJD associates to the infectious spongiform encephalopathies or prion infections. CJD has four categories that includes sporadic CJD, genetic CJD, iatrogenic formof CJD and variant CJD. Phenotypes can be of 6 subtypes on the context of early medical narration which are cognitive,visual,affective, classic,atactic and indeterminate.

It can be inferred that AIWS do not always cause harm and though CJD is quite rare and unique, but it should be included in the diagnosis set up of AIWS, specially in events of fast rational downturn.

Alice in Wonderland syndrome: "Who in the world am I ?"

AIWS is a sudden, recurrent, i tensified somatosensory, and emotional disturbance. This disorientation is generally found in patients with chronic conditions like epilepsy and migraine and also with varied infections or psychiatric disturbances. AIWS comprises of bizarre illusions which is quite infrequent in nature. Here the possible paths associated with AIWS is considered. Here a case of a patient experiencing dysmetropsia of body framework in her son is narrated. The published study on reported cases with AIWS, prospective anatomical paths associated, and useful imaging studies are critically assessed.

Lippman primarily described patients having perceptual and visual disturbances prior to or while migraine episodes and he termed the condition 'Alice in Wonderland', during narrating the cae of 6 patients who were encountering macrosomatognosia or microsomatognosia, of which 4 were having migraines.This rare syndrome was named after the queer incidents narrated by Lewis Caroll in his famous novel 'Alice's Adventures in Wonderland'. AIWS comprises of varoiousbizarre conditions like aschematia,dysmetropsia, disassociation, somaesthetic disturbances, time distortions,akinetopsia, hallucinations,zoopsia,dyschromatopsia and illusions.

An incident of a physically healthy 80 year old woman with a past record of instantaneous perceptual disturbances of her son's right upper limb was reported. The lady briefed of seeing increase in the size of the shoulder and arm and decrease in the size of the hand that remained for 15 minutes alongwith experiencing nauseous headache and blurred vision. Though the lady experienced migraine episodes all throughout her life, the intensity of which reduced over the last few years but he never complained of having perceptual disturbances. Neuroimaging tests diagnosed homonymous hemianopsia, hemorrhage in right occipital lobe and cerebral amyloid angiopathy. The patient complaint of medium holocranial pain with light senstivity. After giving medical care and attention to her, hemorrhagic stroke fully resolved. In addition she was relieved from headache episodes and visual traits.

AIWS is linked with infections because of Zika virus, varicella or H1N1 influenza. A composite neuronal lanes comprising the right temporoparietaljunction,secondary somatosensory cortex, premotor cortex, right posterior insula and primary and extratriate visual cortical areas happen to be associated to AIWS in different levels.

AIWS is an unique syndrome that is rarely reported. There are very few cases of simultaneous presence of cerebrovascular disease and AIWS in clinical studies. Though the vascular lessions were majorly in the right side of the brain in this case,this was not unique.

2. Alien hand syndrome

Alien hand syndrome associated with sensory nerves:

Alien Hand Syndrome (AHS) is a neurological disorder characterized by uncontrolled but meaningful movent of one hand. The patient we will focus on had developed symptoms that consisted of her hand slapping her own face, neck, shoulder and other parts of her body.She had got recognition problems with respect to people and places ,she had lost her physical senses and was feeling slightly weak. Her hand seemed to be "alien" and was no longer obeying the commands of her brain.

She was detected to have lost her primary senses, her neural processes and sensory components were found to be impaired, a lesion was discovered in her right parietal lobe, her vision was also disturbed. Her left arm was affected by the co-existance of sensory, optic and cerebellar ataxia (known as triple ataxia), although there were no issues associated with the moving ability of the left arm . Magnetic Resonance Imaging (MRI) revealed semi severe necrosis (caused by cell death) in the right thalamus, hippocampus, interior temporal lobes, splenium of corpus callosum and occipital lobe due to blockage in the right posterior cerebral artery.

This rare case can be considered as the posterior variant of Alien Hand Syndrome that affects the control over the sensory nerves of the patient while preventing the body from recognizing it's own limb. The conclusions have been reached after studying the Positron Emission Tomography scan findings that were caused as a result of necrosis found in the right posterior cerebral artery, which is very typical of the form of Alien Hand Syndrome caused by damage in the posterior lobe of the brain. The patient was under the impression that her left hand was under the control of someone else, she was continuously trying to prevent it from causing bodily harm. Some tests were conducted on her, the results of which are as follows:

GENERAL EXAMINATION :
Patient was conscious and aware of the surroundings
She lacked co-ordinated movement of the left hand which was characterized by the undershoot or overshoot of the left hand.
Her left limb was performing rapid and alternative movements.
One side of her field of vision was hampered. (for ex: if she was shown the picture of two alphabets placed on two opposite sides, one on left and one on right, on a box , she could only see the alphabet on the right and she could'nt even perceive the box).
She had partial paralysis on the left side that affected her arm's movement.

She was unable to interpret and realize her own condition.
She identified her right hand when she was asked to identify the left.
She could not visually distinguish between her left hand and the left hand of another person standing next to her and was getting confused between the two.
She could not recognize well known people from their pictures.
Visual Identification of colours and objects : Normal
Severe loss of primary senses on the left hand side.

COPYING TEST :

She was asked to copy a diagram :
Results:

With Eyes Open	With Eyes Closed
Random, irregular pen strokes.	Improvement in the drawing, pen strokes were more meaningful.

She was asked to imitate her right hand with her left hand :
Results:
Her left hand could not correctly imitate postures of her right hand.

MAGNETIC RESONANCE IMAGING (MRI) TEST: (OF BRAIN)

Semi severe necrosis in the right thalamus.
Semi severe necrosis in the hippocampus.
Semi severe necrosis in the inferior temporal lobes.
Semi severe necrosis in the splenium of corpus callosum.
Semi severe necrosis in the occipital lobe.

MAGNETIC RESONANCE ANGIOGRAPHY (MGA) : (2D PHASE CONTRAST)

In the Right posterior cerebral artery :
Proximal P-1 segment visualized.
Distal P-1 and P-2 segements not visualized.

No definite cause for posterior cerebral artery was found.
A Polymerase chain reaction based test revealed that the patient was heterozygous for "Factor V Leiden mutation" , which is the mutation of one of the clotting factors of blood that the increase the chance of formation of abnormal blood clots.

POSITRON EMITTING TOMOGRAPHY (PET) : (OF BRAIN)

Performed using Fluorodeoxyglucose (FDG) :
Decreased uptake of FDG in the regions known to have necrosis.
Delicate decrease in the FDG uptake in the right posterior frontoparietotemporal regions.

Our patient had damages in the cortical regions of the right occipital lobe and the right parietal cortex was separated from either occipital lobes, this caused damage to the left hand hampering the ability to read , but fortunately not affecting the ability to write. In cases of damage to thalamus disturbance of vision is common as is also evident in our case. The study of our patient gives us a point to argue that AHS can be considered as a distinguished syndrome in case of damages to the non dominant region of the posterior cerebral artery that results from "triple ataxia" , also associated with loss of vision, non recognition of people and objects, primary loss of senses and weakness of one side of the entire body which is typical in the type of Alien Hand Syndrome caused due to damages in the posterior lobe that affects the regulation over the sensory nerves. There is a future avenue for studies on Alien Hand Syndrome and it's relation to functioning of the sensory nerves.

Alien hand syndrome as a result of co-relation in the nerves leading to unintentional arm movement

Alien Hand Syndrome (AHS) is a disorder that features meaningful , but independent movement of one hand that is unintentionally triggered. This study has been conducted on a patient with corticobasal degeneration along with Alien Hand Syndrome of the left hand , and is targeted at studing the co-relation in the nerves in case of this uncommon neurological disorder. Functional Magnetic Resonance Imaging (fMRI) was employed , it was detected that movements of the alien hand involved certain regions of the brain like primary motor cortex , premotor cortex , precuneus and right inferior frontal gyrus . Intentional movements of the alien hand also involved similar regions of the brain except the involvement of the inferior frontal

gyrus . The results revealed that "alien" and unintentional movements are manipulated by same regions of the brain as intentional movements , the difference lies only in the functioning of the prefrontal areas . Since , the inferior frontal gyrus was the only additional region to get involved during the alien movements , we can derive that this region has some special role in the alien hand movements and in exercising "inhibitory control" over the activities of the motor nerves that lead to the unwanted movements.

Our patient was detected within Parkinson's Syndrome 5 years prior to this incident . 6 months ago he had completely lost the control over his left hand . Restricted arm swing and rigidity accompanied by sudden muscle spasm were noted on the left side of the patient. Addressing his troubles , some tests were conducted on him , the results of which are hereby presented:

TRACER STUDIES :
DOPAMINE TRANSPORTER (DAT) SCAN & Iodobenzamide SINGLE-PHOTON EMISSION COMPUTED TOMOGRAPHY (IBZM SPECT) :
Loss of presynaptic dopamine accompanied by reduction of post-synaptic dopaminergic receptor state .

STRUCTURAL MAGNETIC RESONANCE IMAGING (MRI) :
Increased and asymmetrical Ventricles.

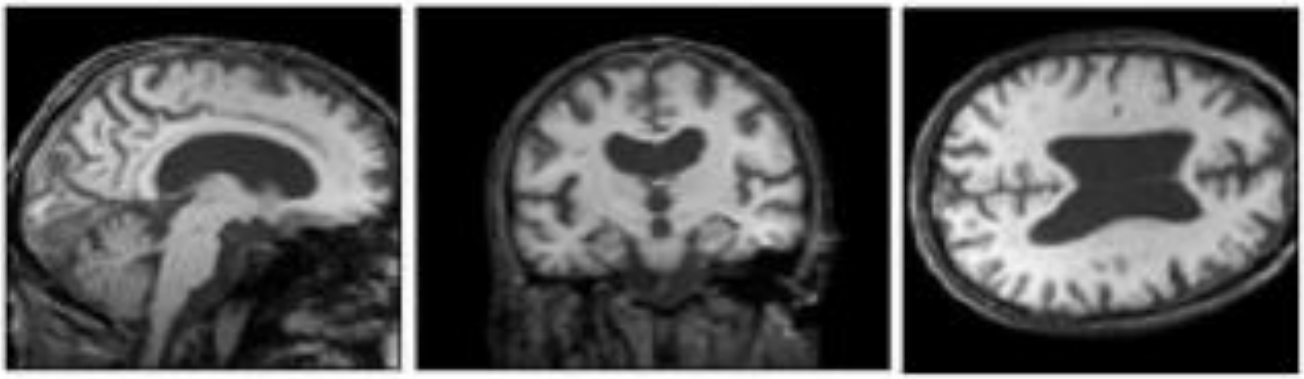

Figure (**1**): Structural MRI showing "altered and increased" ventricles on both sides .
Based on the results, atypical Parkinson's Syndrome with corticobasal degeneration was detected.

NEUROPSYCHOLOGICAL TESTING :
His left hand was grabbing objects and not letting them off.
His left hand was making faulty usage of objects.
Sensation of light touch , pain and pressure were mildly reduced.
His left hand was reaching out for his face.
His voluntary muscle movements were not causing simultaneous involuntary contraction of other muscles.

HAND STIMULATION EXPERIMENT :
Our patient showed unintentional movements of the alien hand whenever the experimenter touched his alien hand.
When the experimenter touched his healthy hand , he showed no movement.

MOTOR LOCALIZER EXPERIMENT :
The patient revealed that operating his alien hand required a lot of "concentration and effort".

The study unveils co-relations in the nerves leading to Alien Hand Syndrome characterized by unwanted, meaningful movement of one hand without the will and knowledge of the patient . The fMRI results have shown us the regions of the brain involved during the unintentional movements which are namely M1 , pre motor cortex , parietal cortex (precuneus) , right inferior frontal gyrus and cerebellum . M1, precuneus and cerebellum are also involved in voluntary movements. Since precuneus and inferior frontal gyrus were involved both in involuntary movements of the alien hand as well as in intentional, voluntary movements of the healthy hand , it can be derived that these structures exhibit "conflict of agency" of the alien hand. In case of motor localiser task or in any other case of unintentional movements triggered by the experimenter, "conflict of agency" might have occurred which led to the stimulation of the precuneus . This is supported by a study performed by Assel et al.

Alien Hand Movements could be triggered in a regulated way by pushing the hand slightly away from the patient's

body , which resulted in movement of the hand in the opposite direction. This can be termed as "Gegenarbeiten" meaning counteracting or working against . The demerit of this system is that slight movements of the alien hand might damage the sensorimotor regions of the brain. These movements are not guided by the intention/will or knowledge of the patient.

There might be a speculation that since pre frontal areas are known to be linked with the "rest state activity" , brain responses in the Inferior Frontal Gyrus (IFG) may be a result of the fact that the patient did not have to perform any task during the first experiment . In contrary to this , since the results of the healthy hand failed to produce any prominent action of the IFG or the other frontal areas , we can argue that the it is not very probable that stimulation of the IFG may be linked with "rest state activity". One may also speculate that stimulation of the ventromedial prefrontal cortex and striatum may be related to the hampered striato-frontal connectivity because of the previous occurrence of Parkinson's disease.

There is a scope of conducting future research studies on more such cases of Alien Hand Syndrome that deal with co-relation in the nerves leading to unwanted alien hand movements.

Relation between left sided alien hand syndrome and stroke

Alien Hand Syndrome (AHS) is characterized by unintentional, unregulated, but meaningful independent movements of an upper extremity. Two noticeable symptoms are feeling of an "alien" limb which is foreign to the patient's body and complicated activities of the motor nerves leading to performance of unwanted actions by the alien hand that are not linked to any other known movement disorder. Following a cerebrovascular accident in the corpus callosum affecting the parietal, or frontal regions, various strange and unregulated motor actions may be caused . Despite various subtypes of Alien Hand Syndrome being reported, this categorization clearly does not extend over the wide clinical variety of abnormal motor activities of the upper extremities. There are only few known researches conducted on the neurophysiology of this syndrome using transcranial magnetic stimulation (TMS).

This case of AHS is a rare one of it's kind dealing with necrosis caused by cell death in the anterior cerebral artery (ACA) as a result of stroke that was responsible for causing a restriction in blood and oxygen supply to the region . The neurophysiologic disorders of the case have been discovered using somatosensory evoked potential (SEP), transcranial magnetic stimulation (TMS) and the Intracortical inhibition (ICI) technique. . In our patient , the brain Magnetic Resonance Imaging(MRI) revealed a severe cerebral "infarction" associated with stroke at the right Anterior Cerebral Artery region, mainly at the right frontal lobe and corpus callosum.

This research outlines neurophysiology related to Alien Hand Syndrome and is a documentation of a rare case, the detections of Intracortical inhibition technique have been instrumental in drawing a conclusion that the reported disinhibition may be responsible for the unwanted hand movements or the unregulated contraction of the muscles that are typical of AHS.

Our patient had experienced a weakness on the left side after suffering from necrosis caused by cell death as a result of stroke in the right anterior cerebral artery . The results of the following tests conducted on her are hereby presented:

PAST MEDICAL HISTORY:
No remarkable medical disorder recorded. No family history of stroke.

After admission, she was diagnosed with diabetes.

KOREAN VERSION OF MINI-MENTAL STATUS EXAMINATION:
Score : 25

MANUAL MUSCLE TEST (MMT) :
Upper left limbs : 60 % Lower left limbs : 60 % Wrist flexor : 40 % Wrist extensor : 40 %

GENERAL EXAMINATION :
She was alert. She was a bit distracted at times. She could perform actions with her left hand. She had no stiffness or tightening of muscles in her elbow and knee joints. Her deep tendon reflex was normal and active. Her superficial sensory responses were unharmed, but physical responsiveness was hampered. She complained that her left hand was not under her control, her left hand snatched objects out of her right hand. Activities of her one hand was aimed at countering the other's actions, showing 'intermanual conflict'.

MAGNETIC RESONANCE IMAGING : (OF BRAIN)
A brain MRI revealed severe cerebral necrosis at the right Anterior Cerebral Artery region, mainly at the right frontal lobe and corpus callosum.

TRANSCRANIAL MAGNETIC STIMULATION (TMS) :

Left motor cortex area	Right motor cortex area
the rMT was 44% and the MEP amplitude was 314 µV.	the rMT was 44% and the MEP amplitude was 456 µV.

In the ICF study, when we stimulated the right motor cortex area, the MEP amplitude was increased to 876 µV. In the ICI study, the amplitude was not decreased, but rather increased to 867 µV .
The Somatosensory Evoked Potential studies using median nerve stimulation were normal with no major differences between sides.

There might be a speculation that cases resulting from damages to cranial lobes or cranial haemorrhages may have many similar symptoms and common effects on the patient , making it difficult to distinguish between such cases and cases arsing from blockages in the cerebral arteries. The uninhibitedness recorded by the Intracortical inhibition technique can account for the left alien hand movements in our patient. Cases such as these are extremely uncommon and provide a lane for further studies on many more similar cases.

Multiple sclerosis co-existing with alien hand syndrome

The Alien hand syndrome is an uncommon neurological disorder characterized by complicated movements of one hand that are not stimulated by the intentions of the patient. No specific description for the various symptoms, causes and effects of the syndrome on the patient's exist , studies of various cases have revealed various regions of damage responsible for causing AHS, including the supplementary motor area, anterior cingulate, corpus callosum, and/or posterior parietal cortex . Therefore, lesions in multiple cranial regions may lead to AHS.

The neuroimaging findings consisting of magnetic resonance imaging (MRI) of the brain confirmed many merged regions of damage in the white matter and a major "involvement of the corpus callosum, particularly affecting the caudal portion" which in all possibility accounted to alien hand symptoms of unwanted , involuntary hand movements . In addition to this, the T1 MRI scan has reported ,"T1 hypointense lesions" ,the so-called "black holes" suggest the presence of areas of severe tissue damage. Alien hand movements are occur mainly as a result of ischaemic or haemorrhagic stroke involving the anterior cerebral artery which lead to restriction in supply of blood and oxygen .This study deals with a woman with history of multiple sclerosis (MS) ,who expressed alien hand symptoms. Even though "inflammatory demyelination and axon damage in the corpus callosum" are significant characteristics of MS, clinical demonstration of alien hand or other signs of disruptions in callosal connection, such as inability to perform learned actions on command or loss of ability to write of the affected hand, have been rarely documented before. From this study, we can concude the role of the corpus callosum in stimulating motor disorders as a result of the lack of hemispheric integration in the patient.

The patient did exhibit an inability to write with the left hand (left hand agraphia) accompanied with a difficulty in planning or executing tasks and movements with the limbs when instructed (limb apraxia). More specifically, "she showed difficulty in writing with her left hand in response to dictation, committing grapheme perseverations (e.g., c*u*oceva → c*o*oceva) and letter substitutions (e.g., conoscenza → conoscen*t*a; nipoti → ni*d*oti) " No significant problems were noticed while writing words and sentences; In order to judge limb apraxia , the patient was instructed to imitate 18 meaningful (MF) and 18 meaningless (ML) gestures to assess "ideomotor apraxia" , her performance was recorded and evaluated by four independent scorers. The results were:

- She was defected with both hands when copying ML postures.
- She was impaired with her left hand when imitating MF actions,

while just touching the cut off score when acting with her right hand (cutoff score for MF actions = 32; cutoff score for ML actions = 31).

One may speculate that her "diagnostic dyspraxia" may depend more on the circumstances under which actions are brought about, than in the features of the act itself, causing dissociative behaviours more likely to be driven by "exo-evoked contingencies and leading the alien limb to be disproportionately compelled by environmental stimuli (exo-evoked) rather than by goals (endo-evoked)". In addition, alien hand behaviours have been reported to be increased in conditions of fatigue, anxiety, or in cases of attention deficits ; all aspects are known to characterize patients affected by MS, and are therefore likely to be responsible for its random/irregular occurrence.

Unilateral agraphia of the left hand, a typical symptom of interhemispheric disconnection was present . Left hand agraphia can be explained in terms of left hemisphere communication mechanisms becoming disconnected from

right hemisphere as an effect of damage to the corpus callosum motor regions that regulate movement of the left hand.

Both alien hand symptoms and limb apraxia in the patient suggest that the hindrance of impulses transfer between the opposite hemispheres may result in motor disorders owing to the lack of hemispheric co-ordination. There is a huge prospect for future studies on the same.

3. Auto-brewry syndrome

A Case Study of Auto-brewery Syndrome with the Bacteria Saccharomyces Cerevisiae as the Organism Causing the Fermentation.

Auto-brewery syndrome, which is also known as the endogenous gut fermentation syndrome is an extremely rare medical dilemma with very few published articles written on its treatment, management, causes and pathology (only 58 reports since the first case appeared).

The following academic research paper is in a case study format whose results are based on a 61-year-old patient of gut fermentation syndrome who was reported to have a high carbohydrate intake as well as a history with antibiotics due to his surgeries. His stool test bacterial profile resulted in containing the yeast "Saccharomyces Cerevisiae", which is commonly seen in the reported stool tests of other ABS patients and is one of the main causative organisms of the fermentation in the Gi causing the syndrome. The patient first reported the symptoms of Auto-brewery syndrome as a result of being prescribed multiple antibiotics due to a surgery for a broken foot, and during this antibiotic course he reported feeling intoxicated while denying alcohol consumption.

In conclusion, Barbara Cordell (Cordell et al), Justin McCarthy who are the authors of these study deduced that this patient had Auto Brewery Syndrome after he and his wife studied the glucose levels and alcohol levels in his body using a diet (glucose challenge) and a Breathalyzer.

The stool composition of bacteria suggests that Saccharomyces cerevisiae was the main causing organism for the fermentation and the fact that the stool composition showed no signs of S. cerevisiae after he received a treatment for the same, shows that the patient indeed had ABS – and was treated aptly for it. The patient's closet drinking being proved wrong provides ground for us to reflect about this case. Being very uncommon, we can conclude that this warrants more research to be done – specifically in cases like that of our patient in this case, where the subject has had a history that is not the same as that of other cases for example, antibiotic users or patients with a history of any chronic gastro-intestinal issues.

Endogenous Gut Fermentation as a Rising Syndrome – A Report of 3 Case Studies

This report includes 3 cases of auto brewery syndrome each of a unique kind, which helps us to build upon the very limited existing knowledge of the Auto – Brewery syndrome. The first case is from the September of 2014 in which a 60-year-old male from Illinois came with a four-year history of "spells" where he felt drunk or hung over – without consuming alcohol. The patient has been an alcoholic who has quit alcohol for 23 years and has not had any alcohol during that time. The second case is from the December of 2014, of a 42-year-old female from Georgia who presented with a several year histories of what she and her husband had coined - "episodes" of drunkenness without consumption of alcohol. The final case is from the May of 2013 of a healthy 32-year-old male from Ohio with a four-year history of gastrointestinal stress. His symptoms were abdominal pain, reflux, and nausea with a 50-pound weight loss and then later a weight gain.

These studies prove that Primary providers should not have the preconceived notion that every patient who has high ethanol and says they have not drunk - is hiding a drinking problem and is a closet drinker; but should conduct out-and-out health history research and have an open mind to the possibility of Auto-Brewery Syndrome or Gut Fermentation.

Additional studies on human microbiomes may provide insight on how imbalances of commensal bacteria in the gut cause yeast to colonize to a pathologic level.

These warrant research as it is needed to establish the symptoms of Auto-Brewery Syndrome in humans as well as the treatment needed to help the patients.

Auto-brewery Syndrome in the Context of Patients with a Long History of Crohn's Disease, Represented in a Case Report Format.

The study involves a 71-year-old patient of Crohn's Disease who has had it for over 50 years. The study analysed the patient for 2 symptoms of the Auto-Brewery Syndrome which are onset of dizziness and slurred speech. The question arose after the results of the study showed increased blood ethanol levels even though the patient had not consumed alcohol for 30 years. Moreover, the man a small bowel resection of unknown length in 1969. After treatment for his bowel resection, he took repeated courses of amoxicillin-clavulanate and metronidazole but suffered from heavy weight loss of up to 4.5kg, and as a result he increased his sugar intake by consuming sugar colas as well as sweets, consequently he developed ABS as a few days later he reported fogginess of thought and difficulty with walking. His wife noticed slurred speech, and he fell while showering. After being taken to the hospital and his blood being tested, his ethanol levels were extremely high (234mg/dl).

A hypothesis was formulated based on the principal findings that the patient's increased blood ethanol levels were because of endogenous ethanol fermentation, or Auto-brewery syndrome. The antibiotic routine of the patient (amoxicillin-clavulanate and metronidazole) was what served as increasing his sugar intake, and therefore serving

as a substrate for the bacteria to grow. As a prerequisite to explaining the results, a thorough explanation of the patient's antibiotic history must be understood to draw conclusions. In 2013, he underwent an antegrade double balloon enterography in which four structures with active inflammation were identified. These were treated with an endoscopic balloon. Small bowel bacterial growth was suspected, and he was prescribed with a 4-week course of amoxicillin-clavulanate, 500/125mg twice daily and metronidazole 500mg thrice daily. This solved his diarrhea and bloating.

A time where the results may not link back to the hypothesis is that it must be taken into consideration that the disease of Auto-brewery is extremely rare, and that the results are not showing a direct correlation with the 2 variables, and therefore due to the rarity of a case where a person with Crohn's also gets ABS could be as a result of a third variable.

Lastly, due to the aforementioned more insight needs to be made into the research of this topic, to make the study reliable because it will be unethical to replicate the study.

A Rare Case of Auto – Brewery Syndrome in a Diabetic and Obese Patient – Presented in a Case Study Format.

The following study is about Auto-brewery syndrome present in a setting of diabetes, obesity, and high carbohydrate intake presented with symptoms and triggers of elevated blood ethanol levels. This study considers the microbiome study in the gut to compensate for the lack of research and treatment involving the issue of auto brewery syndrome. This case is about a 45-year-old obese male patient who has a history with antibiotics for the treatment of deviated nasal septum and dental procedures he reported symptoms of diarrhoea, vomiting, enema, seizures, hallucinations, intermittent fevers, chills, slurred speech, and loss of consciousness precipitated after meals for a duration of 14 months.

Auto-brewery syndrome may be seen in a patient with chronic or long-lasting diseases of the Gastrointestinal tract resulting in elevated ethanol during a high carbohydrate intake as we can see in our patient above. Although not directly related to the gut, obesity and diabetes do play a role in the body's ability to absorb sugar.

The presence of Diabetes shows that as result of a disease interacting with blood sugar, ABS was developed due to factors such as medication, side effects, and diet therefore proving the hypothesis to be true.

A time where the results may not link back to the hypothesis is that that Auto-brewery is extremely rare, and that the results are not showing a direct correlation with the 2 variables, and therefore due to the rarity of a case where a person with Diabetes gets ABS could be as a result of a zero correlation.

Lastly, due to the aforementioned points, more research is warranted, since the rarity of this syndrome may not give us clear insight into the way it interacts with patients who are already suffering from disease.

It is crucial to take into consideration patients of ABS who are also suffering from other diseases directly affecting blood glucose/carbohydrate levels such as Obesity, Diabetes (in this case) and other GI diseases such as the Crohn's disease, to obtain as much information about the underdiagnosed syndrome of endogenous gut fermentation.

4. Conclusion:

This research review's purpose is to help the reader understand different aspects posed by the research on the rare syndromes. This is significant because it gives insights about Alice in wonderland syndrome, alien hand syndrome and auto-brewery syndrome. There has been much research and discussion conducted on these opinions of rare syndromes and it's clinical reports. Most of the research found was on the details of Alice in wonderland syndrome, alien hand syndrome and auto-brewery syndrome . More research and testing is required to gain a better understanding of the findings.

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